Name: Date: Period:

**Genetics/Meiosis/DNA Unit**

1. **heredity** – passing of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. **examples of** **traits** – \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_,

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. **genetics** -- study of how \_\_\_\_\_\_\_\_\_\_\_\_\_\_ are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. **Gregor Mendel** -- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_; used \_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ to

study \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1st experiment – performed pea plant \_\_\_\_\_\_\_\_\_\_\_\_\_\_ for 7 different \_\_\_\_\_\_\_\_\_

5. **offspring** -- \_\_\_\_\_\_\_\_\_\_\_\_\_ generation from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6. **genes** – sections of \_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ on a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. **alleles** – different \_\_\_\_\_\_\_\_\_\_\_\_\_\_ of a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (capital or lower case letters)

\*\*\*\*\*See diagram next brightly colored page

8. **dominant** -- allele that is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (capital letter)

* only need \_\_\_\_\_\_\_ dominant allele to have dominant \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

9. **recessive** – allele that is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (lowercase letter)

* need \_\_\_\_\_\_\_ recessive alleles to have recessive \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

10. **Punnett Sqare** – tool used to \_\_\_\_\_\_\_\_\_\_\_\_\_ all possible \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ combinations

\*\*\*\*\*See diagram next brightly colored page

11. **probability** – mathematical \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that an \_\_\_\_\_\_\_\_\_\_\_\_ will occur

12. **genotype** -- \_\_\_\_\_\_\_\_\_\_\_ displayed (BB, Bb, bb)

13. **phentoype** – organism’s \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ appearance (what you see – examples:

brown, blonde, or black hair)

14. **heterozygous** -- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ alleles (Bb) synonym: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

15. **homozygous** -- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ alleles (BB, bb) synonym: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Genes still a mystery! Must understand **REPRODUCTION**!

Two types:

1. **asexual reproduction** – 1 \_\_\_\_\_\_\_\_\_\_\_ cell needed to produce \_\_\_\_\_\_\_\_\_\_\_\_\_\_

cells or copies

1. **sexual reproduction** – 2 \_\_\_\_\_\_\_\_\_\_\_\_\_ cells join together to form new

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. **parent cells** = \_\_\_\_\_\_\_\_\_\_\_\_ cells
  2. **meiosis** – cell \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that produces sex cells (sperm or egg)
     1. females receive 2 \_\_\_\_\_\_\_\_\_
     2. males receive 1 \_\_\_\_ and 1 \_\_\_\_\_

Genes

1. supply \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ for cell \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and building cell \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. be able to be \_\_\_\_\_\_\_\_\_\_\_\_\_
   * Genes made of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

DNA

**Structure**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Make-up**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_-\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ backbone

\*\*\*\*\*See diagram next brightly colored page

* + **Nucleotides** = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(A), \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(C),

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(T), and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(G)

* + **A** pairs with \_\_\_\_\_\_\_
  + **C** pairs with \_\_\_\_\_\_\_
* **To copy, must** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in \_\_\_\_\_\_\_\_\_

How DNA Works:

* Reads like a \_\_\_\_\_\_\_\_\_\_\_\_
* 3 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ code for an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ acid
* DNA---DNA (A-T, C-G, T-A, G-C)
* DNA---RNA A no longer matches with T; it now matches with U! (A-U)
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ acids form \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to give us \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Problems with DNA:

* **mutations** – change in \_\_\_\_\_\_\_\_\_\_\_\_\_\_ of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in DNA
  + nucleotides \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, or \_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Mutations lead to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (ex: Down syndrome)

Ways to get around gene issues!

1. **Pedigrees** – tools for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ a trait through \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the family

\*\*\*\*\*See diagram next brightly colored page

1. **Selective breeding** – mating organisms with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ traits to

receive the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ gene

1. **Genetic engineering** – transfer \_\_\_\_\_\_\_\_\_\_\_\_ from one organism to \_\_\_\_\_\_\_\_\_\_\_\_\_
2. **Cloning** – creating an \_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Name: Date: Period:

**Genetics/Meiosis/DNA Unit KEY**

1. **heredity** – passing of traits from generation to generation

2. **examples of traits** – blue eyes, brown hair, cleft chin

3. **genetics** -- study of how genes are passed from parent to offspring

4. **Gregor Mendel** -- father of genetics; used pea plants to study genetics

* 1st experiment – performed pea plant crosses for 7 different traits

5. **offspring** – 1st generation from cross

6. **genes** – sections of DNA and protein on a chromosome

7. **alleles** – different forms of a gene (capital or lower case letters)

\*\*\*\*\*See diagram next brightly colored page

8. **dominant** -- allele that is strongest (capital letter)

* only need 1 dominant allele to have dominant trait

9. **recessive** – allele that is hidden (lowercase letter)

* need 2 recessive alleles to have recessive trait

10. **Punnett Sqare** – tool used to predict all possible genetic combinations

\*\*\*\*\*See diagram next brightly colored page

11. **probability** – mathematical chance that an event will occur

12. **genotype** – gene displayed (BB, Bb, bb)

13. **phentoype** – organism’s physical appearance (what you see – examples: brown, blonde, or black hair)

14. **heterozygous** -- different alleles (Bb) synonym -- hybrid

15. **homozygous** – same alleles (BB, bb) synonym -- pure

Genes still a mystery! Must understand **REPRODUCTION**!

Two types:

1. **asexual reproduction** – 1 parent cell needed to produce identical cells or copies
2. **sexual reproduction** – 2 parent cells join together to form new individuals
3. **parent cells** = sex cells
4. **meiosis** – cell division that produces sex cells (sperm or egg)
   * 1. females receive 2 X’s
     2. males receive 1 X and 1 Y

Genes & DNA

1. supply instructions for cell processes and building cell structures
2. be able to be copied

* Genes made of DNA and protein

DNA

**Structure**: double helix

**Make-up** = nucleotides + sugar-phosphate backbone

\*\*\*\*\*See diagram next brightly colored page

* + **Nucleotides** = adenine (A), cytosine (C), thymine (T), and guanine (G)
  + **A** pairs with T
  + **C** pairs with G
* **To copy, must** split in half

How DNA Works:

* Reads like a book
* 3 nucleotides code for an amino acid
* DNA---DNA (A-T, T-A, C-G, G-C)
* DNA---RNA A no longer matches with T; it now matches with U! (A-U)
  + Amino acids form proteins to give us traits

Problems with DNA:

* **mutations** – change in order of nucleotides in DNA
  + nucleotides added, deleted, or replaced
* Mutations lead to genetic diseases (ex: Down syndrome)

Ways to get around gene issues!

1. **Pedigrees** – tools for tracing a trait through generations of the family

\*\*\*\*\*See diagram next brightly colored page

1. **Selective breeding** – mating organisms with desired traits to receive the desired gene
2. **Genetic engineering** – transfer genes from one organism to another
3. **Cloning** – creating an exact copy